

$D^*(2007)^0$

$$I(J^P) = \frac{1}{2}(1^-)$$

I, J, P need confirmation.

J consistent with 1, value 0 ruled out (NGUYEN 77).

 $D^*(2007)^0$ MASS

The fit includes D^\pm , D^0 , D_s^\pm , $D^{*\pm}$, D^{*0} , $D_s^{*\pm}$, $D_1(2420)^0$, $D_2^{*(2460)}{}^0$, and $D_{s1}(2536)^\pm$ mass and mass difference measurements.

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
2006.99±0.15 OUR FIT			
[2006.98 ± 0.15 MeV OUR 2012 FIT]			
• • • We do not use the following data for averages, fits, limits, etc. • • •			
2006 ± 1.5	1 GOLDHABER 77 MRK1 $e^+ e^-$		
1 From simultaneous fit to $D^*(2010)^+$, $D^*(2007)^0$, D^+ , and D^0 .			

 $m_{D^*(2007)^0} - m_{D^0}$

The fit includes D^\pm , D^0 , D_s^\pm , $D^{*\pm}$, D^{*0} , $D_s^{*\pm}$, $D_1(2420)^0$, $D_2^{*(2460)}{}^0$, and $D_{s1}(2536)^\pm$ mass and mass difference measurements.

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
142.12±0.07 OUR FIT				
142.12±0.07 OUR AVERAGE				
142.2 ± 0.3 ± 0.2 145 ALBRECHT 95F ARG $e^+ e^- \rightarrow$ hadrons				
142.12±0.05±0.05 1176 BORTOLETT092B CLE2 $e^+ e^- \rightarrow$ hadrons				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
142.2 ± 2.0	SADROZINSKI 80 CBAL $D^{*0} \rightarrow D^0 \pi^0$			
142.7 ± 1.7	2 GOLDHABER 77 MRK1 $e^+ e^-$			
2 From simultaneous fit to $D^*(2010)^+$, $D^*(2007)^0$, D^+ , and D^0 .				

 $D^*(2007)^0$ WIDTH

VALUE (MeV)	CL%	DOCUMENT ID	TECN	COMMENT
<2.1	90	3 ABACHI	88B HRS	$D^{*0} \rightarrow D^+ \pi^-$

³ Assuming $m_{D^{*0}} = 2007.2 \pm 2.1$ MeV/ c^2 .

 $D^*(2007)^0$ DECAY MODES

$\bar{D}^*(2007)^0$ modes are charge conjugates of modes below.

Mode	Fraction (Γ_i/Γ)
Γ_1 $D^0 \pi^0$	(61.9±2.9) %
Γ_2 $D^0 \gamma$	(38.1±2.9) %

CONSTRAINED FIT INFORMATION

An overall fit to a branching ratio uses 3 measurements and one constraint to determine 2 parameters. The overall fit has a $\chi^2 = 0.5$ for 2 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\langle \delta x_i \delta x_j \rangle / (\delta x_i \cdot \delta x_j)$, in percent, from the fit to the branching fractions, $x_i \equiv \Gamma_i / \Gamma_{\text{total}}$. The fit constrains the x_i whose labels appear in this array to sum to one.

$$\begin{array}{|c|c|} \hline x_2 & -100 \\ \hline & x_1 \\ \hline \end{array}$$

NODE=M061

NODE=M061

NODE=M061M

NODE=M061M

NODE=M061M

NEW

NODE=M061M;LINKAGE=G

NODE=M061DM

NODE=M061DM

NODE=M061DM

NODE=M061DM;LINKAGE=G

NODE=M061W

NODE=M061W

NODE=M061W;LINKAGE=A

NODE=M061220;NODE=M061

NODE=M061

DESIG=1

DESIG=2

$D^*(2007)^0$ BRANCHING RATIOS **$\Gamma(D^0\pi^0)/\Gamma(D^0\gamma)$**

VALUE	DOCUMENT ID	TECN	COMMENT
$1.74 \pm 0.02 \pm 0.13$	AUBERT,BE 05G	BABR	$10.6 e^+ e^- \rightarrow$ hadrons

 Γ_1/Γ_2

NODE=M061225

NODE=M061R3

NODE=M061R3

 $\Gamma(D^0\pi^0)/\Gamma_{\text{total}}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.619 ± 0.029 OUR FIT				

 Γ_1/Γ

NODE=M061R2

NODE=M061R2

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.635 \pm 0.003 \pm 0.017$	69k	⁴ AUBERT,BE	05G	BABR	$10.6 e^+ e^- \rightarrow$ hadrons
$0.596 \pm 0.035 \pm 0.028$	858	⁵ ALBRECHT	95F	ARG	$e^+ e^- \rightarrow$ hadrons
$0.636 \pm 0.023 \pm 0.033$	1097	⁵ BUTLER	92	CLE2	$e^+ e^- \rightarrow$ hadrons

 $\Gamma(D^0\gamma)/\Gamma_{\text{total}}$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.381 ± 0.029 OUR FIT				

 0.381 ± 0.029 OUR AVERAGE

$0.404 \pm 0.035 \pm 0.028$	456	⁵ ALBRECHT	95F	ARG	$e^+ e^- \rightarrow$ hadrons
$0.364 \pm 0.023 \pm 0.033$	621	⁵ BUTLER	92	CLE2	$e^+ e^- \rightarrow$ hadrons
$0.37 \pm 0.08 \pm 0.08$		ADLER	88D	MRK3	$e^+ e^-$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.365 \pm 0.003 \pm 0.017$	68k	⁴ AUBERT,BE	05G	BABR	$10.6 e^+ e^- \rightarrow$ hadrons
0.47 ± 0.23		LOW	87	HRS	$29 \text{ GeV } e^+ e^-$
0.53 ± 0.13		BARTEL	85G	JADE	$e^+ e^-$, hadrons
0.47 ± 0.12		COLES	82	MRK2	$e^+ e^-$
0.45 ± 0.15		GOLDHABER	77	MRK1	$e^+ e^-$

⁴ Derived from the ratio $\Gamma(D^0\pi^0) / \Gamma(D^0\gamma)$ assuming that the branching fractions of $D^{*0} \rightarrow D^0\pi^0$ and $D^{*0} \rightarrow D^0\gamma$ decays sum to 100%

⁵ The BUTLER 92 and ALBRECHT 95F branching ratios are not independent, they have been constrained by the authors to sum to 100%.

NODE=M061R1
NODE=M061R1 **$D^*(2007)^0$ REFERENCES**

AUBERT,BE 05G	PR D72 091101	B. Aubert <i>et al.</i>	(BABAR Collab.)
ALBRECHT 95F	ZPHY C66 63	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
BORTOLETTO 92B	PRL 69 2046	D. Bortoletto <i>et al.</i>	(CLEO Collab.)
BUTLER 92	PRL 69 2041	F. Butler <i>et al.</i>	(CLEO Collab.)
ABACHI 88B	PL B212 533	S. Abachi <i>et al.</i>	(ANL, IND, MICH, PURD+)
ADLER 88D	PL B208 152	J. Adler <i>et al.</i>	(Mark III Collab.)
LOW 87	PL B183 232	E.H. Low <i>et al.</i>	(HRS Collab.)
BARTEL 85G	PL 161B 197	W. Bartel <i>et al.</i>	(JADE Collab.)
COLES 82	PR D26 2190	M.W. Coles <i>et al.</i>	(LBL, SLAC)
SADROZINSKI 80	Madison Conf. 681	H.F.W. Sadrozinski <i>et al.</i>	(PRIN, CIT+)
GOLDHABER 77	PL 69B 503	G. Goldhaber <i>et al.</i>	(Mark I Collab.)
NGUYEN 77	PRL 39 262	H.K. Nguyen <i>et al.</i>	(LBL, SLAC) J

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